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# OBSERVATIONS

AND

## CORRESPONDENCE

ON THE

NATURE AND CURE OF DEAFNESS,

AND OTHER

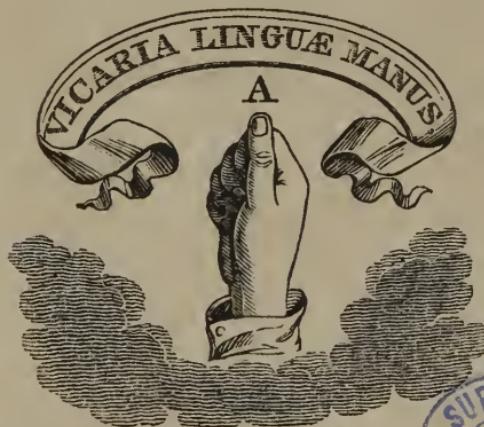
## DISEASES OF THE EARS.

WHICH ARE ATTENDED TO BY

SAMUEL AKERLY, M.D.

PHYSICIAN TO THE NEW-YORK INSTITUTION FOR THE INSTRUCTION OF THE DEAF AND DUMB,

72 CHATHAM-STREET, N. YORK.



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# OBSERVATIONS

AND

## CORRESPONDENCE

ON THE NATURE AND CURE OF DEAFNESS, AND OTHER  
DISEASES OF THE EARS.

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Dr. SAMUEL AKERLY, Physician to the New-York Institution for the Instruction of the Deaf and Dumb, may be consulted in cases of deafness and other diseases of the Ears, at his residence, No. 72 Chatham-street, New-York.

Having paid particular attention to the cure of deafness and diseases of the Ears, he is enabled, from his knowledge of the anatomy and structure of the Human Ear, to give satisfactory explanations of the various affections of that delicate organ, which requires to be treated with care and nicety, and occasionally to be strengthened by constitutional as well as local remedies. A powerful incentive to have more attention paid to the organ of hearing than has heretofore been the case, arises from the fact, that all the Deaf and Dumb were not born so, many becoming Deaf from sickness and diseases of the ears, and Dumbness being the necessary consequence.

The following are some of the affections to which the Ears are liable, all of which have a tendency to produce deafness—viz.

1. Inflammation in the Eustachian Tubes, or inner passages to the Ears.
2. Obstructions in the Eustachian Tubes.
3. Inflammation in the Meatus Auditorius, or outer passage of the Ear.
4. Obstructions in the outer passage, from hardened wax, or thickened matter, &c.
5. Abcesses in the tympanum.
6. Abcesses in the Meatus Auditorius.
7. A morbid or bad secretion of wax in the Ears.
8. A diminished secretion of wax.
9. A want of secretion, or dryness in the Ears.
10. Ulcerations and a discharge of matter from the Ears.
11. Fungous Excrencences in the Ear.
12. Foreign substances in the Ear, as peas, beans, shells, paper, &c. pressed in by children.
13. Insects in the Ear, as worms, bugs, flies, ticks, and other insects, which creep in while the person is asleep.
14. Noises of various kinds in the head.
15. Ear-ache accompanying some of the foregoing affections.

These numerous diseases of the Ear require a treatment as different as they are various, and as nice a discrimination as any other class of diseases to which the human frame is subject. It must therefore be evident, that no single remedy or nostrum is applicable to diseases where their causes, symptoms, and effects, are so diversified; as may be well imagined, by examining the annexed Diagram, or Map of the human Ear, upon an enlarged scale.

Dr. Akerly has found by experience, that deafness from hardened or accumulated wax in the Ears, is easier cured than running of matter from the Ears, and the latter more so than nervous Deafness: but he has been enabled to afford relief in cases of these three principal divisions of diseases of the organs of hearing. He has cases in reserve, for some future publication, on the Diseases of the Ear. In the meantime, he refers to Mr. Henry Remsen, Captain John Rooke, Mr. Isaac Pierson, Mr. John Franklin, Mr. John Slidell, Mr. Henry Post, jun. Mr. Ithamer Osborn, and others, who have had their children or themselves relieved of affections of the Ear.

The following extracts from the Reports to the Legislature, will show what has been the result of attention to one of the Deaf and Dumb pupils at the New-York Institution.

*Extract from the Report to the Legislature of New-York, made  
1st of January, 1820.*

" James Maddock, of Peterboro, Madison County, New-York, is 8 years old, and was received into this Institution in May, 1819. His deafness was caused by sickness at four months old, followed by fits. At the age of 20 months, he appeared to be totally deaf. Sometimes, however, his hearing would in a measure return; and he had been taught to speak a number of words, which were uttered in a low monotonous tone. These periods, however, were so seldom and so short, that his parents found it impossible to impart to him the rudiments of learning in the ordinary way, and accordingly sent him to this Institution.

" He has been under the operation of remedies for ten weeks, since which his hearing has been quickened and very much improved. During this time he has been practised in elocution, by Mr. Horace Loofborrow, who is very sensible of the boy's improvement. His ears were at first in a dull and torpid state. There was no secretion in one, and the other was filled with black indurated cerumen. The secretion is now improving and much more natural. He speaks audibly and distinctly his letters and single words. Mr. Roger Maddock, on a late visit to New-York, was much gratified with his son's improvement in hearing and speech, which was very evident to him.

" There appears to be no radical defect in the organ of hearing, nor want of energy in the auditory nerves. There is nothing to obviate, but a tendency in the external passage to the ears to relapse into a morbid state of secretion. By attention to the

means which will prevent that, James Maddock will by practice, completely recover his hearing, and become a social and speaking being, and no longer be a *Deaf Mute.*"

The above is my report on the case to the Directors of the New-York Institution for the Deaf and Dumb, and incorporated in their annual report to the Legislature.

During the winter nothing was done for Maddock, but in the spring and summer of 1820, attention was occasionally bestowed upon him, to keep his ears in a clean and healthy state; and in the autumn his father withdrew him from the Institution.

Mr. Maddock's letter of thanks to me was annexed, as a document to the annual report to the Legislature, dated 1st January, 1821, and is as follows:

“Peterboro, (Madison County,) Dec. 8th, 1820.

“SIR,—When on my passage from New-York to Albany, I thought it my duty to write you on the subject of my son's recovering his hearing. Whether the letter I wrote was such as answered your expectations, I do not know; but I am now willing to say, that while my son remained under your care, his hearing very much improved, and I think he can now hear with the left ear as quick as ordinary persons, but not quite so well with the other. I must repeat, that I feel myself under the greatest obligation to you for your attention, and have the greatest reason to expect that it will produce the most lasting benefit to my son. I also feel thankful for the advice given in your letter as to the future treatment of James. I dare not venture to send him to school, but must needs have him constantly with me. As far as is practicable, I observe the directions you have given, although I find it frequently very burthensome to give that attention to him which is necessary. There can be no question, that there are instances in which an attention to the ears will remove the cause of deafness, and the experiment on my son is proof in point. We had resorted to many measures recommended by various persons, without being sensible of any benefit, until he was placed at the institution. Mrs. Maddock joins me in sentiments of gratitude and respect.

“ROGER MADDOCK.

“To Dr. Samuel Akerly, Physician to the  
N. Y. Institution for the Deaf and Dumb.”

“The original letter, from which the foregoing was copied, has been examined by me, and is now in the possession of Dr. Akerly.

“SAMUEL L. MITCHILL,

“Pres't of the Institution for the Deaf and Dumb.  
“New-York, 17th Feb. 1821.”

George Holkins, another one of the Deaf and Dumb pupils, was cured of a long standing discharge from the ears, but his hearing was not restored.

Among the cases of nervous deafness, often so distressing and so difficult to cure, the following may claim a place. The certificate was sent to me with an apparent intention to have it published in the newspapers, which, however, I have declined.

"This is to certify to whomsoever it may concern, that I have been very much relieved of hardness of hearing, by Dr. Samuel Akerly, Physician to the New-York Institution for the Instruction of the Deaf and Dumb. Being on the point of departure for Europe, and feeling grateful for the benefit I have received, I take the liberty of making it publicly known, that others similarly situated may know where to seek and find relief. I have been deaf for nearly four years, occasioned by a cold, and my hearing was so bad that I could not hear ordinary conversation, and therefore avoided company, as I had no inclination to speak when I could not hear what was said. I could not hear a watch tick, unless when close to my ear, and now I can hear it held in my hand at the distance of two feet. My deafness was of that kind, that the Physicians whom I consulted called *nervous deafness*, attended with dryness of the ears and noise in the head.

"E. BEMENT.

"New-York, 21st July, 1820."

The method of giving advice at a distance, may be ascertained by the following letters, in answer to applications for relief.

*New-York, 4th September, 1820.*

DEAR SIR,—It is impossible to determine the proper remedy applicable to Miss P—'s case of deafness, without further information than that communicated. She has written for medicine, under the impression that deafness is the same in all persons, and that the same remedy is applicable to all cases. She will be undeceived in this particular, if you enclose to her my circular. I am not in the practice of preparing medicines, and sending them off, to be applied to cases of diseases indiscriminately. In other cases of deafness, good remedies sometimes fail for the want of their judicious application: so they may in deafness. It is not only the remedy, but the particular application and method of using it, that constitutes its value; and, by daily observation, to know how to modify it, so as to suit the circumstances of the case as they occur. With the same remedy a patient might deceive himself, for a want of the knowledge of the object in using it, or, in medical language, of *the indications of cure*. In some cases, however, where the patient could not leave home, I have been consulted, and explained my method of applying the remedies to a Physician near the patient, who was informed of the prescriptions, and who was to apply them. But the want of apparatus and instruments, and practical dexterity, are apt to put both the patient and Physician out of patience, where he has not devoted himself to the subject. I would rather, both on my own account, as well as for the greater certainty of relief, have the personal attendance on the patient.

You may state to Miss P—, that there are three principal kinds of deafness, all of which have more or less variety and modifications. If you propose the following queries to her, I shall be enabled, on receipt of her answers, and a consulting fee, to give such an opinion on the case as I believe will be agreeable and satisfactory to her.

How long have you been deaf?

Was it caused by a cold, or sickness, or sore throat?

What is the degree of hearing left?

How far off can you hear a watch tick?

Can you hear a watch tick when held in the mouth?

Required the age and general state of health?

Have you ever had gatherings in the ears?

Are you troubled with ear-ache?

Do you wear a cap or ribband over the ears?

Are you troubled with cold feet?

Do you take snuff?

What colour is the moisture or wax in the ears?

Are you liberal in the use of strong tea or coffee?

Does the wax in the ears dry on the passage, and become scaly?

I am, Sir, respectfully yours, &c.

SAMUEL AKERLY.

To Mr. D—, of Virginia.



New-York, 1st November, 1820.

SIR,—Your case of deafness is one of those called nervous, and is more difficult to cure than those which arise from hardened wax, or a running of matter from the ears. Both of these I can cure in a given time; but in the former there is greater variety and diversity, and consequently the time required to produce a salutary effect, cannot be at first ascertained. Practical experiments, under the care of a judicious Physician, must determine the probable time that the remedies I shall propose will take to produce the desired effect. I have reason to believe, that a favourable impression may be made upon your organs of hearing; but perseverance and steady attention will be required, and it may take more than the whole of the warm season of 1821. Let me not discourage you, however, by unfortunate anticipations—though if I should promise you a hasty or certain cure, I should do you and myself injustice. If the object to be obtained is at all desirable, it is not the less valuable if it arrives slowly and gradually. I know there is a difficulty in commanding the attention and perseverance of a patient in the application of remedies to a chronic disease, and such nervous deafness must be considered; but as hearing is so essential to our social existence, I trust that the means will be perseveringly applied. Warm weather being the best season to apply the remedies, you should not begin till next spring. I feel encouraged, from your good state of health and the strength of your constitution, in having entirely overcome the

paralytic affection. The nervous debility which yet adheres to the organ of hearing, may possibly be removed by the following means.

These means may be considered as, 1st, external remedies—2d, Internal remedies—3d, Agents for the application of these remedies—and, 4th, Things to be avoided.

### 1. External remedies.

The external remedies are those which may be usefully applied to the external ear. The object to be obtained by them in your case, is, to produce an excitement or an action upon the surface in the neighbourhood of the external ear, and thereby relieve that internal action of the blood vessels which causes the distressing noises in your head. These arise from arterial pulsations in the internal ear; and as blisters and sinipisms in other diseases relieve by producing a determination to the surface, so may the external remedies I shall propose relieve that internal action which produces tinnitus aurium. For this purpose, I have used *tincture of soap, eau de Cologne, spirits of camphor, tincture of cantharides, and blisters.*

The tincture of soap may be used daily to wash the ears, and have it well rubbed on behind them, on and about the petrous portion of the temporal bone. The eau de Cologne and spirits of camphor may be used in the same way. But if the parts should become accustomed to their stimulating effects, the tincture of cantharides will excite more action, and if repeated, even draw a blister. A blister may be occasionally applied behind the ears, alternately with the other applications.

### 2. Internal remedies.

By internal remedies, I do not mean those which are to be taken into the stomach, but such as are applied to the ears by means of a syringe through the meatus auditorius. Our object here is to act upon the relaxed and torpid organs, by injecting into the ears mildly stimulating and oleaginous preparations. Among those which I use, I send you a sample of the three best for nervous deafness, and the recipe by which they are prepared. Either of these may be used with advantage, by injecting them into the ears daily with a small ivory syringe, and then cleaning them out after the manner herein directed, with cotton on a probe. I would prefer your using these internal remedies as follows:

The materials of No. 3 separate on standing still, and should be shaken together before use. In the evening, drop into the ears eight or ten drops of this mixture, and stop them up with wool, so that it does not run out at night when in bed. In the morning syringe with No. 1 or 2, and clean them out, and leave the ears open during the day, to have the benefit of sounds, unless the weather should be cold and blustering, when they must be guarded with wool.

### 3. Agents to apply the remedies.

The first of these is a small ivory syringe. The head should be inclined on a table; the injection blood-warm, poured into the passage of the ear, and then the syringe applied and worked gently for a minute or two. The head may be then quickly turned over a spitting box, and the injection suffered to escape. In using the syringe, care should be taken not to use it too long or too forcibly, as injury may arise from the violence, causing dizziness or vertigo as the first effects.

The next operation is to clean the ears out with a probe. For this purpose I have short probes, about two and a half inches long, with one end of an octagonal shape, that they may be easily turned in the fingers. The end introduced into the ear is guarded with cotton rolled on, and projecting a quarter of an inch beyond the metal, so that when it is turned around to clean the sides of the passage, the hard substance does not come in contact with the delicate membranous lining of the passage, or of the drum of the ear. When the cotton becomes wet, it is to be removed and renewed.

Cotton is most frequently used to stop the ears, to guard them from cold; but I prefer wool, as it is a non-conductor of heat, and consequently keeps the ears warm, whereas ~~cotton~~ being a good conductor of heat, causes it to escape, and is therefore not so good as wool for our purpose. Cotton should only be used to clean the ears. I enclose you a probe armed with cotton, more clearly to explain the method of using it.

### 4. Things to be avoided.

Every thing that produces excitement, or a determination of blood to the head, increases the noise in the ears. Violent exercise, a full meal, liquors, strong tea and coffee, have an effect upon the nervous system, and are therefore to be used in moderation. Electricity is recommended by some authors in nervous deafness, but my practice confirms me in a contrary opinion. I would advise you not to employ it as an agent in your cure.

The result of the puncture of the tympanum in one of your ears is sufficient, I hope, to deter you from a similar operation in the other. Yours is not the only case I have seen in which it has been unsuccessful. Wright, a late English author on Deafness, condemns the practice, and says that it universally fails, though it has been recommended by Astley Cooper, a celebrated Surgeon of London. The rigidity of the scar formed on the drum by the healing of the puncture, will render that ear less susceptible of improvement.

Now, Sir, after this detail of proceeding under the different remedies proposed, &c. I will state how you may make a daily use of the means. I suppose the climate at New-Orleans will allow you to commence in March, though it would not here until the latter part of April, or first of May.

Begin then as follows:—At night on going to bed, let your

wife, or some one else, drop into your ears eight or ten drops of the injection No. 3, and then stop them with wool.

In the morning when you rise, wash the auricles (ears) and behind them, by the aid of a sponge, with either of the four liquids mentioned under the head of external remedies. This operation you can perform yourself, and will take up no more time than washing the hands and face. If you should apply a blister, let it be at night, and of course the other applications would be omitted till the blister was healed.

After breakfast, your Physician will remove the wool, and fill the ears with injection No. 1 or 2, warmed. Then after syringing and emptying the contents, let him wipe them out clean with the probe armed with cotton, as above stated. The ears are then left open and clean for the services of the day, and the means are again applied at night. These are the remedies and means that, from my view of your case, are calculated to give you relief. I have endeavoured to be explicit, as you requested; but if I have not been so, I hold myself ready to supply any thing omitted, or to answer any suggestion which the case may give rise to, either to yourself or your attending Physician.

I am, with respectful consideration,  
S. AKERLY.

To Mr. S——, New Orleans.

— - —  
*New-York, May 1st, 1821.*

SIR,—I have received your letter, requesting an opinion whether it is possible to restore to hearing and speech a person who is Deaf and Dumb, and also whether a person so restored has a finer sense of hearing than people in general? and if so, what encouragement can be given in relation to your son, who is Deaf and Dumb?—These questions, I perceive, are suggested by a paragraph which has appeared in our newspapers, copied from a French paper, as follows: “The Journal, the narrator of the muse, relates a circumstance highly important for humanity. It states, that a young Physician had just discovered (October, 1820) a method of restoring both hearing and speech to the Deaf and Dumb, and had tried it with full success upon two individuals of this description. The editor adds, that the two youths who had just experienced the efficacy of the operation, have a finer sense of hearing than persons in general.” Parental anxiety has prompted these questions, and I will endeavour to answer them, though you may not be perfectly satisfied with the replies. But I would warn you not to be too sanguine, nor to expect miracles from the operation of natural causes. The first question I would answer in the affirmative, and the second in the negative. As to your son, the answer would be hypothetical, and I should therefore decline an opinion till I became acquainted with all the circumstances connected with his deafness. I shall state the facts which have led me to these opinions.

1st. Is it possible to restore to hearing and speech a person who is Deaf and Dumb?

I answer, yes. In some cases it is possible, though not in all; but those cases cannot be determined a priori. A number of Deaf and Dumb persons have been restored to hearing in England and France, as may be seen by consulting Wright on Deafness, and Curtis on the Diseases and Physiology of the Ear, as well as the writings of M. Itard, Physician to the Deaf and Dumb Institution in Paris, to be found in the *Journal des Science Medicale*.

2. Has a Deaf and Dumb person, after being restored to hearing, a finer sense of sound than others?

I answer, no: for instead of being more delicate, it is at first a painful sensation, as you may well imagine, when a person is introduced to the noise and tumultuous sounds of active life, after having been excluded from them by a defect in hearing. Loud and shrill sounds are generally distressing to all who can hear, and particularly so to the Deaf and Dumb, or other persons who have been hard of hearing, when the sensation is returning. The principle is the same when the cataract is removed for blindness. The person operated upon can see, but the sensation is so new and painful, that it excites inflammation, and he must be shut up in a dark room, that light may be gradually introduced to an organ unaccustomed to it.

3d. As to your son, you must give me a detail of his case, and let me examine the ears. Where children are born deaf, there is a probability of some organic defect, and less chance of restoration, though some such have been restored; but many children become deaf from sickness, and may be helped. Some of the Deaf and Dumb have a partial sense of hearing, but not sufficient to enable them to articulate distinctly. Deafness in them, as in others who are only hard of hearing, has arisen from various causes, as, measles, scarlet fever, small-pox, dropsy in the head, foreign substances in the ear, gatherings, running from the ears, hardened wax, no secretion of wax, &c. I make three great divisions of the diseases of the ear, viz. *nervous deafness*, *otcrrhaa*, or running from the ears, and *deafness from hardened wax*, all of which have their varieties, and are to be treated differently.

As to the paragraph from the French paper above quoted, it appears, that an operation first performed by Surgeon Cooper, of London, and frequently repeated in England, has at length reached the interior of France, and comes out as something new. The puncture of the tympanum, or drum of the ear, was suggested by Mr. Cooper some time ago, in cases where the Eustachian tubes were obstructed; and immediately after the operation, the person had a painful sensation of hearing, as in cases of seeing, after the depression or extraction of the cataract. So it appears from the relation of the French cases. But experience in England has proved, that this operation is not to be depended upon, or has been performed in improper cases; for the result is, that although hearing follows the operation, deafness again ensues, and the per-

son operated upon is worse afterwards. I have seen two such cases here, where the persons were operated upon by a celebrated Surgeon of our own country. The punctured tympanum closed, and leaving a rigid scar upon the drum, the hearing was finally impaired instead of being improved. Another account which I have seen in our papers, stated, that the Deaf and Dumb children operated upon by the French Surgeon, began immediately to speak. This is fallacious, and totally impossible. How can a person never accustomed to sound, understand an arbitrary impulse of the breath, which to him would have no more meaning than the whistling of the wind? Sounds, signs, and symbols, have no meaning except by convention or association. The child, therefore, who, having been Deaf and dumb, is restored to hearing, must be taught to speak slowly and gradually, as other children are taught, before he can understand letters, words or sounds spoken by another. If it were otherwise, what language would the child speak?

I am, dear Sir, respectfully yours, &c.

SAMUEL AKERLY.

To Mr A——, Ulster County, Nem-York.

In conclusion, Dr. AKERLY would observe, that there are some affections of the ear which he can certainly cure, some which he can only relieve, and some which he cannot cure. He pretends to no infallibility—he uses no secret remedies—he imparts to other Physicians his means and method of applying them. The merit he claims, is derived from practice and attention to this peculiar class of diseases, to which he has been led by his connexion with, and as one of the Directors and Physician to the New-York Institution for the Instruction of the Deaf and Dumb.



#### EXPLANATION OF THE MAP OF THE EAR.

The ear is the organ of hearing, and when its parts become deranged, injured, or diseased, deafness ensues, and the person so affected becomes *mute*, or in common acceptation, *Dumb*. Under such circumstances, the unfortunate person loses that correspondence or sympathetic association which exists between the organs of hearing and speech, whereby the latter are rendered inactive and silent. The sound of the human voice, when perfect, consists of modulated tones; to produce which, the person speaking must hear, in order to vary the tones, and produce harmonious articulation. Hence we find, that a deaf person does not speak, because he cannot hear; and although it is very possible he may be taught to speak by imitation, yet the voice is monotonous or inharmonious for want of the ear to regulate it. Thus it would appear, that hearing is absolutely necessary to smooth and harmonious articulation, but not to simple utterance or speech, since practice has confirmed the belief, that in most cases the Deaf and Dumb may be taught to speak.

The organ of hearing is so essential, and withal so delicate, that it is strongly protected in a hard and bony case; but notwithstanding it is well shielded from external injury, accidents will reach and disease assail it. Hence in every society of human beings, there will be Deaf Mutes. They are more numerous than most people imagine. But if we consider the causes which operate in producing this unfortunate condition, the surprise excited by the fact will moderate by the inquiry.

Human nature is frail, and at all times subject to accident, disease, and death. Thus "in the midst of life we are in death." Instead of being surprised at this, we should rather exclaim with the Psalmist,

" Strange that a harp of thousand strings  
Should keep in tune so long."

We should be led to these reflections upon examining the structure and delicacy of the organ of hearing, as displayed in the annexed map of the human ear, and hence not wonder at the numerous causes which affect this organ and produce deafness.

Deafness is sometimes connate, and generally supposed in such cases to proceed from original defect, or malconformation of the ear. These cases are numerous, and thought to be irremediable. But it is doubtful whether some of them do not happen from causes at or subsequent to birth, and before the infant acquires the use of its vocal organs. If such should be the case, there may be some prospect of relief; and this opinion is strengthened by observations on some of the Deaf and Dumb pupils of this Institution, which now exceed fifty.

The numerous ills which "flesh is heir to," and the various accidents of life, may fall upon the organ of hearing. Concussion of the brain, blows on the head, fractures of the bone, may produce deafness; and if they happen in early age, the child becomes *Dumb*, or is ever after a *Mute*. Even though it had begun to speak, it soon ceases to exercise the organs of speech, as all things around are wrapped in profound silence. Extraneous substances lodged within the passage to the ear, also occasion distress and deafness; and the natural secretion of wax within the ear, when accumulated, often operates as an extraneous body. Insects may penetrate the ear and destroy the hearing.

The most fruitful source of deafness, however, arises after birth, from the various diseases to which the human frame is subject. Fevers and inflammations are the most common. Measles, scarlet fever, small-pox, inflammations in the throat, tonsils, nose and the ears themselves, are often the operating causes; and though they frequently impair the organs of hearing beyond the possibility of recovery, yet we know that all are not beyond the power of relief.

With age comes infirmity, and deafness often warns us of approaching dissolution. Though the deafness of age does not produce dumbness as in children, yet it is distressing to all social be-

ings, and generally produces silence and reserve. It has in all grown persons a marked effect upon the speech, in producing a low and monotonous voice. Deafness from age is the least likely to be removed by curative means.

The annexed Map contains an enlarged view of the organ of hearing and its appendages, which may be divided into their external and internal parts. The external parts are, the *auricle*, the *meatus auditorius*, and the *Eustachian tube*. The internal are, the *tympanum*, with its *membrane* and *bones*, and the *labyrinth*, with its *foramina*, *membranes* and *cavities*.

The *auricle* or external ear, collects the vibrations of sound. These are compressed at the *concha*, or commencement of the auditory passage, which is somewhat funnel shaped, from whence they pass through the *meatus auditorius* to the *membrana tympani*, commonly called the drum of the ear, behind which lies the proper organ of hearing. The *Eustachian tube* is a narrow passage, with a trumpet-like opening, commencing in the pharynx or back part of the mouth, a little above the lower passage of the nose, and passing obliquely upwards to the internal ear. Hearing is increased by the passage of sounds through the Eustachian tube; and hence a person intent upon hearing, not only stands *auribus erectis*, (with pricked up ears,) but opens his mouth to receive the strongest impression. The *meatus auditorius* and *Eustachian tube* are both laid open in the map, to show their cavities. The *cerumen*, or wax of the ear, is secreted from small glands in the auditory passages.

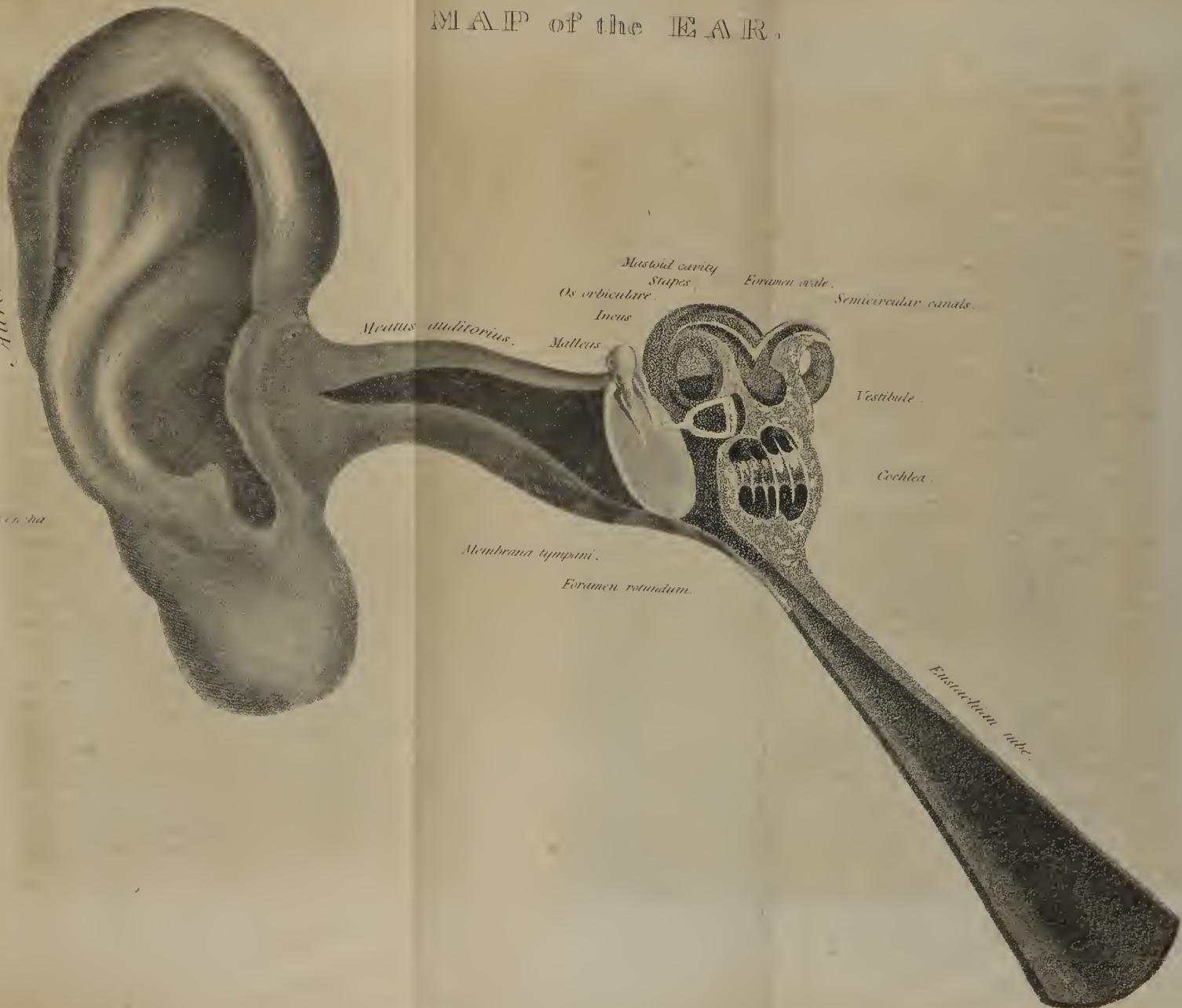
The *Eustachian tube* opens into the *tympanum*, or cavity of the internal ear. This cavity is separated from the *meatus auditorius* by means of the *membrana tympani*, or drum of the ear, which is stretched across the passage. The cavity of the *tympanum* contains four small bones, which are not the least curious of the wonderful structure of this organ. The *malleus* is attached to the membrane of the *tympanum*, and with its muscles produce a tension or relaxation of that membrane. Articulated with the *malleus* at its upper extremity is another small bone, of a similar shape, called the *incus*. To the small end of the *incus* is attached a very small bone, nearly round, and from its shape denominated *os orbiculare*. The fourth bone is the *stapes*, or stirrup, with one end united to the *os orbiculare*, and the other to the *foramen ovale*, by means of a membranous lining. The *stapes* is situated transversely to the cavity of the *tympanum*, and from its slight attachment to the neighbouring parts, sometimes from disease falls into the *Eustachian tube*, and is discharged by the mouth.

The *labyrinth* of the internal ear is so called from its intricate winding passages, through which sounds are reflected, and their effect increased. It consists of the *vestibule*, with its three semi-circular canals, and the spiral cavities of the *cochlea*. Within the cavity of the *tympanum* are two *foramina*, which lead to the different parts of the *labyrinth*. The *foramen rotundum* com-

MAP of the EAR.

Auricle.

Cochlea





municates with the lower range of the cochlea, but is closed by a fine membrane about the middle of the passage; so that the external air which passes through the Eustachian tube into the tympanum, does not reach the cavities of the labyrinth. The *foramen ovale* is also protected by a membrane, and the bottom of the stapes covers it. At the top of the tympanum is a broad and short passage leading to the mastoid cells, which are thought to assist hearing by forming a kind of echo. The vestibule is a cavity situated behind the foramen ovale, and almost round. It is covered with a membranous lining, filled with numerous blood vessels. The three semi-circular canals diverge from the vestibule, and are filled with a peculiar fluid. There are eight small foramina or openings belonging to the vestibule: five of them communicate with different parts of the semi-circular canals, one leads to the upper range of the cochlea, and two serve for the transmission of nerves, which branch from the *portio mollis*, or soft portion of the auditory nerve.

The cochlea is opposite to the semi-circular canals. It is so called from its resemblance to the internal spiral contortions of a snail shell, and is divided into two parts, an upper and a lower range. There is a small foramen or opening from the vestibule into the upper range, and another from the foramen rotundum into the lower range, thus connecting the different parts of the labyrinth together.

The nerves which originate from the brain, pass in pairs to the different organs which they influence. The seventh pair are the auditory nerves, particularly so called, and are divided as they pass from the brain into two portions. The largest and uppermost is called the *portio mollis*, or soft portion of the auditory nerve, and is considered as the nerve particularly belonging to and influencing the organ of hearing. The distribution of its branches to the minutest filaments, is confined to the labyrinth, its vestibule, cochlea, and semi-circular canals. The *portio dura*, or hard portion of the auditory nerve, is distributed to the meatus auditorius, and other parts of the ear.

The membrane, or drum of the ear, is supplied with nervous energy from the *chorda tympani*, which passes over the membrane like the chord at the bottom of a drum, and has its origin from a branch of the fifth pair of nerves which supply the organs of speech. After crossing the drum of the ear, the *chorda tympani* unites with the *portio dura* of the auditory nerve, and thus by its association forming that necessary correspondence between the organs of hearing and of speech.

There are, moreover, blood vessels which distribute their branches to the different parts of the ear, and supply it with that necessary fluid, to promote warmth and secretion. When the organs of hearing become diseased, the pulsation of the arteries sometimes causes distressing noises in the head, which are difficult to be removed,

The very extraordinary and delicate structure of the organ of hearing is secured in a cavity of the temporal bone, called the *petrous*, or *rocky portion*, on account of its comparative hardness. It would thus appear to be a very essential organ, as it is more securely protected than the brain itself. How thankful should we be who enjoy our hearing in perfection, and participate in that divine blessing! especially when we see so many around us, whose hearing is so impaired as to render them mute, and totally incapable of restoration.



## CASES OF DEAFNESS, AND DISEASES OF THE EARS.



### A BUG IN THE EAR CAUSING DEAFNESS.

In the summer of 1817, John Walker called on me to remove an insect in one of his ears. He stated, that two months previous, when asleep, some living creature crept into his ear, and while alive, created great pain and distress. The insect was killed by spirits and other liquids poured into the ear, before he obtained any relief. When he called on me he was very deaf in that ear, and the deafness was increasing. He was sure the insect was still there, though his wife had examined and could not see it. On putting him in a proper position and light, I could observe something black, and with the help of a probe and small forceps, removed a worm-like insect, nearly half an inch long. It had no wings, but a long body, with transverse sections, and was probably the *larva* of a *Coleopterous insect*. The man went away satisfied, and some time after informed me that his hearing in that ear had gradually returned.



### A FLY IN THE EAR.

A person called on me in August, 1819, with a fly in his ear, which gave him unaccountable anguish. The pain and distress were occasioned by the struggles and buzzing of the insect, which however was not constant, or it would have been intolerable. A small fly had in the day time crept into the *meatus auditorius* (or passage of the ear) and had got his legs fastened in the wax of the ear. His efforts to extricate himself, and the buzzing occasioned thereby, produced the unpleasant effect upon the organ of hearing. With a probe I soon removed a living fly, and relieved the distressed patient.

### MALFORMATION OF THE EAR.

October 15th, 1819. Nancy Stevens, aged 44 years, the mother of several children, has an imperforate ear on the left side. The auricle or external ear, is a narrow cartilaginous ridge, while the organization of the right ear is perfect and the hearing good. She has been subject to ear-ache ever since she was a child, from abscess in the ear, which breaks into the eustachian tube, and discharges by the mouth. This happens every once in a while, particularly in the winter, on taking cold. It is remarkable that the pain and abscess always takes place in the defective ear, and never in the sound one. Her children, five in number, have their ears and hearing perfect. These facts were ascertained on the 15th October, 1819, when she was complaining of ear-ache, and applied to me for relief.

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### MALFORMATION OR IMPERFORATE EAR.

Mrs. S—— C——, late of New-York, but now residing in an adjoining state, has an imperforate ear on the left side. In place of the auricle, there is a small semi-circular cartilage, but no mark or indentation where the passage should be open, the whole being covered with a smooth skin. The other ear is perfect, and the hearing is as acute with that as if she had two. She is the mother of one child, who is not deficient in its organs of hearing.

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### INFLAMMATION IN THE EAR.

January, 1820. Mrs. C. Devoe was seized with violent ear-ache in January, 1820, while I was attending her sick husband. Upon examination, the affected ear was found to be in a high state of inflammation in the auditory passage, which completely shut it up, and prevented me from using a mild and mucilaginous injection which I had proposed. In place of that, an onion poultice large enough to envelope and surround the ear, was directed and applied, which caused the pain and inflammation gradually to subside, to the great relief of the patient.

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### FOREIGN SUBSTANCES WILL PRODUCE EAR-ACHE.

Eliza Briare, aged about eight years, one of the pupils of the New-York Institution for the Deaf and Dumb, was several days troubled with ear-ache, and upon examination, paper was found stuffed in the ears, and with some difficulty removed, after which the pain ceased. Some time after, in the month of January, 1820, she was sent to me with an older pupil, and upon inquiry what they wanted, the eldest spelled with his fingers, "*paper in her ear.*" I saw something deep in her ears, and upon applying my ear forceps and hook, I removed a quantity of cotton from each ear without pain. The cotton was so far down in the ear,

that Mrs. Stansbury, (then Matron to the Deaf and Dumb Asylum,) not being able to see distinctly, thought that it was paper as before.

#### A SHELL IN THE EAR.

The daughter of Mrs. Wm. Keese, aged eight years, appeared at times to be inattentive and hard of hearing, which alarmed the parent with the prospect of increasing deafness.

Upon examining the ears, there appeared to be nothing in the passages except cerumen, and that in no great quantity, nor of a bad appearance. In cleaning the ears the mystery was soon solved, as a piece of a nut-shell, enveloped in wax, was removed from one ear. This brought to recollection the fact formerly stated by the child, that there was a shell in her ear, but as it could not be seen the mother doubted it. From the statement of the child, it must have been in the ear two or three months. The shell was removed in April, 1820.

#### ULCERATION AND DISCHARGE FROM THE EAR CURED.

John Rooke, aged 13 years, son of Captain John Rooke, applied to me on the 27th April, 1820, for the cure of a discharge from the ear of eight months standing, caused by frequent swimming in the salt water in 1819. The discharge was copious, soiling his pillow every night. The matter was not offensive, and there was no pain in the ear; but the discharge produced blisters where it ran out of the ear.

By an astringent injection used daily, and the ear well cleaned with a probe armed with cotton, the discharge began to diminish, and in four weeks was entirely well. As the discharge abated, a natural secretion of wax was promoted by the use of a stimulating oleaginous mixture. In this case, though the hearing was somewhat diminished, it was not materially affected by the disease, and with a cure of the discharge the hearing was restored.

#### DISCHARGE FROM THE EAR RETURNED, BY SWIMMING IN THE SALT WATER.

Two or three months after the cure of the preceding case, the discharge from the ear was brought back by the boy's propensity and practice of frequent swimming and diving under the salt water. When this practice was laid aside, there was no difficulty in again checking the discharge.

#### HEARING IMMEDIATELY RESTORED ON REMOVING HARDENED WAX.

July 24th, 1820. Mr. Ithamer Osborn had a hardness of hearing and noise in the left ear, caused as he thought by jumping in

the river when in a state of perspiration. On examining the affected ear, it was found to be completely plugged up with hard black wax. The sudden check to the perspiration when he jumped in the water, may have altered the secretion of wax in the ear, which had been for some time in that diseased state. He was immediately relieved, and the hearing restored in that ear by removing a lump of black wax, as hard almost as a nut, and larger than a pea. The drum was left clear and clean, and the hearing became as perfect as ever it was.

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#### A GRAIN OF INDIAN CORN REMOVED FROM THE EAR.

In the month of August, 1820, a child of Mr. William Isaacks pressed a grain of Indian corn into one of its ears, which was soon discovered by its mother, but it was so far in as to be beyond her reach.

In my absence, by means of my ear forceps, my brother soon removed the obstruction, and the alarm of the mother ceased. The grain of corn remained in the ear so short a time, that no injury followed.

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#### EAR-ACHE.

I was called, Sept. 10th, 1820, to a most distressing case of ear-ache in a man belonging to the sloop Industry, of Troy, while she lay at the wharf in New-York. On the preceding evening he had slept on the deck, which caused the ear-ache, and on the afternoon of the tenth, he put cold water in his ear for relief, but it soon increased the pain. The pain was so intolerable that he said he should go crazy if not soon relieved. About sunset I bled him 18 ounces, his pulse being full. This gave him some relief, which was not lasting. By nine o'clock at night he became delirious, or was so by spells. I poured into his ear warm oil: amygdal: dulc: and syringed it well. Then with cotton on a probe I cleaned it out, and again filled it with the warm oil, and stopped the ear up with wool. After giving him 60 drops of laudanum he lay down, and though he had some severe returns of pain, yet in the course of an hour he became easy, fell asleep, and rested quiet most of the night. In the morning I found him reading the newspaper, though he still had some throbbing in the ear.

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#### EAR-ACHE SYMPTOMATIC OF OTHER DISEASES THAN THOSE OF THE EAR.

In September, 1820, Miss Julia Smith was several days complaining of stiffness of the neck and ear-ache, attended with difficulty of swallowing. When I was consulted, the throat was very much swelled and inflamed, and the pain in the ear was found to proceed from *cynanche tonsillaris*, or quinsy sore throat.

The right tonsil was greatly enlarged, and the patient was informed that the pain in the throat, which passed to the ear through the eustachian tube, would not be entirely relieved, till the swelling of the tonsil broke or was opened. The next day she resolutely submitted to have the tonsil (or almond of the ear) opened with a lancet, and the pains and swelling abated on the discharge of the matter. The operation was followed by a drastic cathartic, after which the patient rapidly recovered.

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## POPULAR REMEDIES.

### INDIAN CURE FOR DEAFNESS.

The *podophyllum peltatum* grows in the Southern states. The root when boiled and made into a syrup, is given as a purgative. A drop of the juice of the fresh root in the ear, is deemed a cure for deafness.

*Dempsey's manuscript read before the New-York Lyceum of Nat. Hist.*

**NOTE.** The *podophyllum peltatum* is the mandrake of New-York, and grows in this state as well as to the South. It has been used by an Indian Doctor of New-York, by the name of the *Old Squaw*, as an emetic.

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### INDIAN CURE FOR THE EAR-ACHE.

Take a piece of lean mutton, about the size of a large walnut, put it into the fire and burn it for some time, till it becomes almost reduced to a cinder; then put it into a piece of clean linen, and squeeze it until some moisture is expressed, which must be dropped into the ear as hot as the patient can bear it. This has been tried in a family at Madras, in more than one instance, and gave immediate relief, after laudanum and other medicines had been ineffectually applied.

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### BURGUNDY PITCH.

Burgundy pitch enveloped in cotton, and introduced into the ear, has been found serviceable in difficulty of hearing, depending on a rheumatic affection, or atony of the ear.

[*Eberle's Mat. Med.*

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### ALLIUM SATIVUM.

The late Professor Barton, of Philadelphia, thought garlic an excellent application in deafness from atony or rheumatism. For this purpose he recommended a clove of garlic to be surrounded with cotton, and introduced into the ear, on wool or cotton moistened with the juice and applied in this way.

[*Eberle's Mat. Med.*



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